Are all primitives created equal?

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Pre-proof version

Abstract: Primitives are both important and unavoidable, and which set of primitives we endorse will greatly shape our theories and how those theories provide solutions to the problems that we take to be important. After introducing the notion of a primitive posit, I discuss the different kinds of primitives that we might posit. Following Cowling (2013), I distinguish between ontological and ideological primitives, and, following Benovsky (2013) between functional and content views of primitives. I then propose that these two distinctions cut across each other leading to four types of primitive posits. I then argue that theoretical virtues should be taken to be meta-theoretical ideological primitives. I close with some reflections on the global nature of comparing sets of primitives.

1. Primitives and Theories

A term is primitive within a theory when, relative to that theory, the term cannot be defined in a non-circular way. Given that circularity of definition provides no further insight into the meaning of the term that we are attempting to define, a primitive must be accepted as non-definable, or un-analysable. All theories require primitives, and primitives are explanatorily basic. No theory that hopes to be explanatory can forever introduce new terms in order to define other terms. Without primitives, a theory would contain an infinite regress of terms. The choice of primitive(s) is up to the creator of the theory. Anyone is free to declare any part of their theory as primitive. Some disagreements between theories can be analysed as disagreements about what to take as primitive. This is especially the case if we think that the commitments of a theory should be derivable from the primitives of that theory, or that the primitives will provide the ultimate explanation of various aspects of the theory.

For example, and as has been discussed extensively in Benovsky (2013, 2016), take the debate about attribute agreement in metaphysics. The central question is 'how is it possible that two objects share the same property?' The debate is highly complex, but let us focus on three possible solutions. First, there are those that posit a bare particular that instantiates a repeatable, multiply located universal. Under this view, two objects *a* and *b* share the same property F if *a* and *b* both instantiate the numerically identical universal F-ness (see Armstrong 1978, Mertz 2001). Second, the tropes-bundle view. This view holds that there is no bare particular or substrata, and that instead all that an object is is a bundle of compresent non-repeatable and non-multiply locatable property tropes. Two objects *a* and *b* share a property if they both have as part (or as constituent of, or have as a member) numerically distinct F-tropes that are qualitatively identical (see Williams 1953, Paul 2017). Third, we could take objects as a primitive,

non-analysed entity. This 'resemblance nominalism' view holds that *a* and *b* both share the same property if they are both members of the same resemblance class (see Rodriguez-Pereyra 2002). Each of these views has been defended in the literature recently, and each seems to be a currently live option to explain attribute agreement.

These briefly sketched solutions to the metaphysical puzzle all posit important primitive notions. The first says that there is a primitive identity relation between one instance of a universal, F-ness, and another instance of F-ness; the second holds that a primitive exact resemblance holds between two property tropes; and the third says that there is a primitive resemblance relation between objects *a* and *b*. In each case, (at least) a primitive relation is appealed to, and, as it happens, in theories two and three a resemblance relation.

The primitives in all three theories play a central role in providing an answer to the original question of when is it the case that two objects share the same property. This kind of primitive is what Benovsky calls a 'problem-solver' (2013: 344). Without these primitives, each of the theories would not be able to solve the original problem. That the primitives play this important explanatory role is not a problem for the theories. Positing a primitive that does no theoretical work would seem needlessly profligate, as it is commonly accepted that primitives *should* be explanatory. Given that they sit at the most explanatorily basic level, if a primitive has *no* explanatory role, then it would appear to be redundant.

However, there is a lingering problem: are the primitives that we pick to play the role of problem-solvers *ad hoc*? An intuitive way to understand if a posit is *ad hoc* is if the posit is introduced to save a theory from a particular problem and there is no additional reason to posit it except to solve that problem.[1] The issue is that primitives will often, at least to those who wish to object to the theory in question, look like they are ad hoc. To the person who accepts universals and so uses a numerical identity relation between universals to explain attribute resemblance, the trope theorist's posit of a resemblance relation looks ad hoc. And vice versa. We are taught that we should avoid ad hoc posits, but whether we think that a primitive is ad-hoc or not seems to depend on the viewpoint from which you are viewing the posit in question. Those inclined towards a theory will likely not find a posit to be ad hoc; to those opposed to the theory, the opposite could well be the case.

What we need is a way to compare primitive choices to see which is to be preferred. Typically this is done through a consideration of a range of theoretical virtues, the relative importance of which is not universally agreed upon. This means that what counts as a good or more favourable primitive is decided by a range of further concerns and commitments, many of which are not always fully explicated, or are, I will argue, themselves further primitive commitments.

In the rest of this paper, I will take up this question of how we pick between primitives. Are all

[1] This is not offered as a precise definition of what makes a posit ad hoc. Nothing in this paper rests on a specific notion of what it is for something to be ad hoc, only that there is a distinction between ad hoc and non-ad hoc posits.

primitives created equal? Are there some that are inherently better than others? I will begin by sketching some distinctions that are important in understanding the different kinds of primitives that a theory might appeal to, before commenting on how we might begin to choose between primitives. My examples will come from metaphysics, but primitive choice is an important issue in all theories and as such what I say here will carry over into other areas.

2. Ideology vs. Ontology

The difference between ideology and ontology is a much-discussed distinction dating back at least to Quine:

> Given a theory, one philosophically interesting aspect of it into which we can inquire is its ontology: what entities are the variables of quantification to range over if the theory is to hold true? Another no less important aspect into which we can inquire is its ideology (this seems the inevitable word, despite unwanted connotations): what ideas can be expressed in it? ... It is clearer, I think, to recognize in ontology and ideology two distinct domains of inquiry (Quine, 1951: 14).

Ontology is what exists; ideology concerns the concepts that appear within the theory. Primitive ontological commitments are those entities within our theory that are non-reducible to further entities;[2] primitive ideological commitments are those concepts within a theory that cannot be defined in terms of other concepts.[3]

It is often held that the non-primitives aspects of a theory will 'come for free', what Armstrong described as an 'ontological free lunch' (1997: 12). His focus was specifically on those entities that supervene on, or are entailed by the primitive entities. But the notion can be expanded to cover ideology too. An 'ideological free lunch' then refers to those concepts that we get for free once we have accepted the primitive ideological concepts. The 'free' concepts are definable from the primitive ideology.

The decision to favour (primitive) ontological or ideological posits within the theory is a choice that can have a wide influence on the character of that theory. Take as an example debates about modality. An actualist wants to limit their ontology to just those entities that exist in the actual world, denying the existence of mere possibilia. There are many ways to do this, but one

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[2] One alternative way to understand this would be to say that the primitive ontological commitments are those entities we take to be fundamental. Under this conception, the fundamental entities are the most basic elements of reality, from which other elements of reality are derived, or ultimately ground the non-fundamental. Nothing I say here rests on this notion of fundamentality. See Bliss (2017) for a discussion of various roles that the notion of 'fundamental' can play in our theorising.

[3] To see the difference in action, in the example about attribute agreement, in theory one, the bare particulars and the universals would be ontologically primitive, and the instantiation relation and the identity relation between universals a primitive ideological commitment. In theory two, the tropes would be the sole ontological primitive, and the instantiation relation, the compresence relation, and the resemblance relation would be ideologically primitive. In theory three, the objects would be the sole ontological primitive, and the resemblance relation between those objects would be ideologically primitive.

prominent route is to refuse to analyse the modal operators. The modal operators are accepted as primitive bits of ideology within the theory, thereby allowing us to limit the number of entities that we are committed to in our ontology. This kind of actualist favours ontological parsimony at the cost of a more complicated ideology (see Fine 1977).

In contrast, Lewis' modal realism (1986) favours ideological parsimony over the ontological variant. Lewis wants to reduce modal claims, rejecting the idea that modal claims are irreducibly intensional. Instead, modal claims are extensional claims about worlds, and the entities in those possible worlds. These are real, concrete entities and Lewis is fully ontologically committed to them. This delivers ideological simplicity for Lewis as he no longer is required to accept un-analysable modal operators. It is for similar reasons that Lewis accepted the existence of sets in order to gain the benefits of set theory:

> It offers an improvement in what Quine calls ideology, paid for in the coin of ontology. It's an offer you can't refuse. The price is right; the benefits in theoretical unity and economy are well worth the entities… the benefits are worth their ontological cost (Lewis, 1986: 3–4).

The moral here is that ontological and ideological parsimony will often be a trade off. An ontological posit might reduce ideological cost and vice versa, but it is far from clear, prima facie, which we should prefer. Why should we think that ontological parsimony is better than ideological parsimony? Given that, as noted above, we all must posit some primitives within our theories, which of these kinds of primitives should we prefer? Should we in our theories posit ontological or ideological primitives? From debates about modality, we can see that this choice is not a clear one.[4]

A further consideration that appears when we want to decide on whether to posit ontological or ideological primitives has been discussed by Cowling (2013). This relates to two distinct ways in which a theory might be ontologically parsimonious and two ways in which it might be ideologically parsimonious:

> NO-Parsimony: Quantitative ontological parsimony, which concerns the number of ontological commitments.
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> KO-Parsimony: Qualitative ontological parsimony, which concerns the number of kinds of ontological commitments.
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> NI-Parsimony: Quantitative ideological parsimony, which concerns the number of ideological commitments.
>
> KI-Parsimony: Quantitative ideological parsimony, which concerns the

[4] See Shapiro (1993) for a more detailed discussion of the ontology-ideology trade-off, and the use of Occam's razor in the case of modality (though Shapiro does not discuss, as I do here, the question of the primitiveness of the theoretical virtues themselves). The moral of Shapiro's discussion is much the same as mine – a reduction of ontology for ideology, or vice versa must be philosophically justified, and Occam's razor cannot be 'wielded blindly' (1993: 473).

> number of kinds of ideological commitments. (see Cowling 2013: 3897; 2017).

Thus, the choice between favouring a parsimonious ontology or ideology is more complicated than it first seemed to be. Take Lewis' acceptance of the existence of sets. Lewis could claim that whilst he is rejecting NO-Parsimony as he accepts the existence of sets, he is respecting KO-Parsimony as the entities that he is accepting are all of the same kind. As Lewis states: 'I subscribe to the general view that qualitative parsimony is good in a philosophical or empirical hypothesis; but I recognize no presumption whatever in favour of quantitative parsimony' (1973: 87).

Cowling is less clear about how we might draw the kind vs. number distinction in the case of ideological parsimony. The reason for this is that we have less of a grip on how it could be that some bits of ideology are of the same *kind*. Perhaps ideological kindhood is too mysterious to be useful. However, as Cowling notes:

> KO-Parsimony does not come with a comprehensive analysis of ontological kindhood, but has not been dismissed on these grounds. And, while one might propose that ontological kinds are simply natural kinds like tiger and electron, such a proposal precludes a suitably general application of ontological parsimony to contexts where theoretical virtues are crucial but natural kinds are not relevant (e.g., murder mysteries and set theory). There is, then, no settled account of ontological kindhood. But, since this does not license us to reject (KO-Parsimony), we have no compelling reason to reject or dismiss (KI-Parsimony) (Cowling, 2013: 3898).

Whilst I agree with Cowling on this point, we can at least point to an example of a debate where we seem to understand the idea of an ideological kind to show that we do have a working grasp of the idea. The example comes from recent defences of 'big-G Grounding' (hereafter just 'grounding').

Proponents of grounding argue that grounding is one relation that can replace instances of a variety of metaphysical relations that we previously have thought to be distinct. Grounding is a unitary notion, and one that can replace various more variegated relations that metaphysicians have otherwise been interested in (see Audi 2012; Rosen 2010; Schaffer 2009). Grounding is also widely taken to be a primitive (see Fine 2012; Rodriguez-Pereyra 2005; Rosen 2010; Schaffer 2009; Witmer et al. 2005). Importantly for my purposes here, grounding is additionally taken to be an internal relation.[5] This means that it is not a further *ontological* posit, but rather holds just

[5] That grounding is internal is a common assumption within the literature; see Raven (2015), and Rosen (2010). Indeed, that grounding is internal is part of why Bernstein (2016) and Schaffer (2016) both argue that grounding and causation must be distinguished, as causation is not internal. Bennett (2011: 33) goes further to argue that grounding is 'superinternal', though note that Bennett is explicit that the claim that grounding is superinternal should not lead us to think that it is not internal, as she holds that every superinternal relation is also internal.

in virtue of the existence of the relata it relates, and the intrinsic nature of those relata. Grounding is, I will assume, a bit of ideology, not ontology.

Schaffer provides the relations between the following entities as 'clear examples of grounding':

> (i) the entity and its singleton,
>
> (ii) the Swiss cheese and its holes,
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> (iii) natural features and moral features,
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> (iv) sparse properties and abundant properties
>
> (v) truthmakers and truths (Schaffer, 2009: 375)

For its proponents, grounding simplifies and unifies an otherwise overly complex family of relations that are all variants of ontological dependence, and this parsimony is certainly a major part of why grounding is popular.[6]

However, not everyone is convinced. One prominent line of dissent has been to argue that grounding is not a unitary relation. The argument here is not to deny that there are metaphysical relations between entities of the kinds listed above, but just that the relations are not the same. Koslicki (2015) argues that two claimed examples of grounding relations – the determinable-determinate relation and the Aristotelian genus-species relation – are importantly different and cannot actually be instances of the same relation. Wilson (2014) independently, but to a similar conclusion, argues that a number of the relations which are taken to be instance of grounding, such as token identity, realization, the classical extensional part-whole relation, the set membership relation, the proper subset relation, and the determinable-determinate relation are too distinct to be unified under one course-grained metaphysical relation.

The grounding proponents are therefore arguing that grounding is a univocal ideological kind. Many of the more fine-grained relations that metaphysicians had previously been focused on are replaced with instances that kind. However, the dispute is not about the number of instances of the relations that there are. Rather it is about whether all the instances are in fact instances of a single univocal kind. The objections held that instead we need a number of different kinds of ontological dependence relations (at least some of which, presumably, would be primitive). The disagreement is over the numbers of *kinds*, not about the number of instances. The two sides might agree on how many instances of grounding or ontological dependence relations hold in the world; they disagree about whether we need to posit one or more ideological kinds.

The example of grounding illustrates that we have some grip on the idea of an ideological kind. We can also point at a potential instance of kindhood in ideology that will significantly influence

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[6] The applications for grounding have so far included (amongst others) metaphysical foundationalism (Schaffer 2010a), truthmaking (Cameron forthcoming; Liggins 2012; Schaffer 2010b), intrinsicality (Witmer 2014, Rosen 2010), perceptual knowledge (Chudnoff 2011), temporal ontology (Baron 2014), and the nature of mental content (Trogdon 2015). Whilst of course these papers overlap, they are independent discussions of grounding, relative to the specific aims listed here.

the very plausibility of the theory in question. This time consider ontological pluralism. The ontological pluralist believes that there are multiple different ways in which things can exist (or, if preferred, multiple ways of being). Aristotle, Aquinas, Descartes, Russell, Moore, and Heidegger have all at different times been seen as, or perhaps accused of being, ontological pluralists (see Turner 2010; see McDaniel 2009, 2017 for a recent defence). My focus will be to comment on one particular argument against ontological pluralism, namely that it is an unparsimonious theory, as it requires the positing of multiple quantifiers.

Quantifiers are a classic example of bits of ideology. Quantifiers do not 'exist' in the way that a table does. Quantifiers rather are bits of our theorising that help us understand the commitments and consequences of those theories. Thus, the claim against the ontological pluralist is that they posit an unneeded multiplication of ideology. Occam's razor is invoked, and ontological pluralism is rejected. The ontological pluralist might respond by rejecting the underlying Quinean criterion of ontological commitment, but let us assume that they wish to maintain the criterion. Our ontological pluralist therefore will likely say something like this:

> ontology is about what existential quantifiers range over. I simply deny that there is only one of them. Rather, there are many — maybe one, '$\exists_1$', which ranges over abstracta, for instance, and another, '$\exists_2$' which ranges over concreta. If you want to talk about abstracta, you have to use '$\exists_1$'; if you want to talk about concreta, you have to use '$\exists_2$' (Turner, 2010: 7-8).

Of course, saying this is what allows room for the parsimony argument. Why posit multiple quantifiers when, at least so the ontological monist will say, we can make do with just one? I will leave aside here Turner's discussion on the parsimony argument (what he calls the 'economy argument'; 2010: 28-34). His responses may be sufficient for ontological pluralists. I wish to offer at least the seeds of a further response that could be developed.

The new response holds that whilst the ontological pluralist might be rejecting NI-Parsimony, they accept and embrace KI-Parsimony, which says that the number of primitives in a theory is not important. What is important is the number of *kinds* of primitives. It certainly does seem to be possible for the ontological pluralist to argue that they are positing only one *kind* of ideological primitive – primitive existential quantifiers – just like the ontological monist.

Working out the full details of this response is beyond the scope of this paper. Perhaps the monist will respond that the distinct quantifiers are in fact different *kinds* after all. My contention is only that given that this option would at least prima facie be available to the ontological pluralist, then we can see that ideological kindhood, and the difference between the four forms of parsimony listed above is important when it comes to creating and defending a theory. It is not enough for the ontological monist to complain that ontological pluralism is unparsimonious simpliciter. They must also argue that we should be motivated by NI-Parsimony. How we might do that without begging the question against the ontological pluralist is less clear.

3. Functional Role vs. Content

A further distinction that is relevant to comparing primitives comes from Benovsky (2008, 2013, 2016). This concerns the role and nature of the primitive within our theories. The first understands primitives through the function that the primitive is introduced to play. Such primitives are introduced with little (or even no) comment as to the specific nature of the primitive itself. Their nature remains something like a Lockean 'we-know-not-what', and they are introduced instead just as a 'we-do-know-what-they-do' (Benovsky 2013: 345). The nature of the primitive remains a mystery, but we get a grip on the primitive through the functional role it plays. A good example of this is instantiation. Relatively little is said about the nature of instantiation. Armstrong, when introducing instantiation only remarks that it is a tie that holds a universal and a bare particular together (1997). What the primitive *does* is more important than what it *is*.

Alternatively, a content view of primitives says that there is more to a primitive than just its functional role. As Benovsky notes: 'under this view, if two primitives perform the same function, they may still not be the same thing, and thus they may not be metaphysically equivalent, but only theoretically equivalent (that is, equivalent for all theoretical purposes). The slogan goes: even if they do the same thing, they are not the same thing' (2013: 346).

Perhaps one way to grasp this distinction is through an analogy to the debate between the categoricalist and dispositionalist about properties. The dispositionalist will say that there is nothing more to a property than what it disposes an object to do – nothing beyond the causal powers that it bestows upon the property. The 'disposition is thought to be a persisting state or condition that makes possible the manifestation' (Mumford 2010). A property in the actual world is the same property in some possible world iff it bestows the same causal profile on the object in that possible world that instantiates it as it does in the actual world. The categoricalist rejects this. For example, Armstrong (1989, 1997) says that there is a 'quiddity' to a property – a this-ness for properties. This means that the same property could have a different causal profile (or bestow alternative causal powers to an object) in different possible worlds. Properties are more than just their causal profile.[7]

Analogously, if a primitive is understood purely functionally, then there is no sense in which a different primitive could play the same functional role. If a primitive plays the same functional role in a different theory, then they are the same primitive. In contrast, under the content view, numerically different primitives could play the same functional role.

Benovsky's distinction is a valid one, but overlooked is how the ideology/ontology distinction plays into this. Benovsky largely skates over the ideology/ontology distinction, or reduces that distinction to one of the primitives having a different functional profile. For example, he states:

[7] Not all categoricalists will accept quiddities, however these more complex details do not bear on the analogy being used here. For an overview of this debate, see Choi and Fara 2012.

> Think of the claim that one theory's problem-solver is a relation and the other theory's problem-solver is a substratum, and so they are entities with a different nature. What does such a claim amount to? Perhaps what one wants to say here is that there are some differences between the two problem-solvers like, for instance, the fact that a substratum is 'ontologically independent' (that is, it can exist without exemplifying any properties) while the relation of compresence cannot just 'be there' and relate nothing. But if that were the difference between the two problem-solvers, interestingly, it would be a functional difference: it would be something the substratum can do ('standing alone', tying no properties together) that compresence cannot do. So, in such a case, the Functional View applies: there is a difference between the two problem-solvers, and it is a functional one (Benovsky, 2013: 349-50).

Benovsky takes the difference between the primitives to be one of function as part of his argument that we should prefer the functional view over the content view. However, a more natural understanding of this is through the ideology/ontology distinction. Let us consider the first two options from the above discussion of attribute agreement to explore this fully.

The substrata-universal theory posits two primitive ontological entities – universal properties and substratum – and two ideological primitives – an instantiation relation and an identity relation between instances of the same universal. We might be inclined to initially think of these relations as further ontological entities but that would be wrong. These relations are taken to be *formal*. They are formal in the same way that ontological categories are formal and thus are not further elements of reality beyond the existence of the entities that fall under those categories.[8] The same goes for the relations of instantiation and identity. They are ideological primitives as they cannot be defined or analysed further within that theory; but they come at no *ontological* cost (they are an 'ontological free lunch'), as they are internal relations.[9]

Alternatively, the bundle-trope theorist posits just one primitive ontological entity – tropes – and

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[8] Ontological *categories* are part of the ideology of our theory. They do not exist as further entities over and above of the entities that fall into those categories. The members of the categories are ontological commitments; the categories are ideological. See Lowe (2006) for a view like this, and Miller (2016) for defence of that view.

[9] Internal relations are contrasted with 'external' relations, which are additional entities – additional ontological posits. In contrast, internal relations are part of the ideology of a theory as statements involving the relations will express truths ('Object O instantiates property p' expresses a truth about O), but the truthmakers for the statement will be non-relational. If, say, causal relations are external (see references in footnote 5, though see Lowe (2016), Simons (2016), Heil (2016) for arguments against the externality of causation) then statements about causal relations also express truths, but the truthmakers for those statements will involve the positing of a relational property. This would mean that causation will be a genuine relational property within our ontology, not just our ideology. None of this, though, rules out some internal relations that are part of our ideology being primitive as in the case of identity and instantiation. They are internal for the reasons stated, and primitive as they cannot be defined or analysed further within that theory. External relations may also be primitive ontological commitments. For example, if we believe that causal relations cannot be reduced to non-causal properties then causation would appear to be a primitive ontological commitment of that theory. For examples of this, see Tooley (1987) and Carroll (1994).

three ideological primitives – an instantiation relation, a compresence relation, and an (exact) resemblance relation. These relations are ideological in the same way as under the substrata-universal theory. They are no 'addition' to our ontology. They are formal concepts that we use in order to describe the nature of reality.

Once again leaving aside debates about which of these views is correct (and various more complex versions of these views), we can see the difference in what 'problem-solving' primitive has been invoked. As Benovsky states: 'one theory's problem-solver is a relation and the other theory's problem-solver is a substratum' (2013: 349). This means that one is an ontological primitive whilst the other is an ideological primitive. To clarify, my claim is not to deny that there is potentially a difference here in function or in content. That may be the case. My claim is only that there is *at least* also a difference in choosing an ontological or an ideological primitive in this case. The difference between the primitives is at least partly explained by the difference that one is ontological and the other ideological.

With this in mind, I propose that these two distinctions cut across each other leading to four options for a primitive. A primitive that we posit could be:

1) A purely functional ideological posit

2) A purely functional ontological posit

3) A non-purely functional ideological posit (the content view)

4) A non-purely functional ontological posit (the content view).

This four-way distinction illustrates quite how different primitives can be. However, I will outline one further kind of primitive before commenting on how we go about primitive choice.

4. Theoretical Virtues as Primitives

We have seen that a primitive can come in four types, as created by the intersection of the ideology/ontology and the functional/content distinctions. We have also seen how when we try to compare primitives, we must be aware of quantative and qualitative parsimony. This means that at least with respect to parsimony, we can favour (or reject) kind or number parsimony for each of these primitive types. Given this, and the potential effect that parsimony could have on our primitive choice, we might ask what parsimony really is. My claim will be that parsimony, and other theoretical virtues, are primitives too, albeit ones that do not fit neatly into any of the above categories.

We have already seen that parsimony comes in many different forms. However, those distinctions provide neither a definition nor justification of parsimony. Why should we believe that parsimony is a virtue in our theories? I am not the first to question what our warrant for

accepting parsimony (or the related notion of simplicity) is.[10]

There are two initial reasons why we might support parsimony. First, we could argue that parsimony is epistemologically justified. A parsimonious theory proves a greater understanding of the target phenomenon compared to an alternative equally explanatory but less parsimonious theory. Second, we might think that nature itself is parsimonious. Following Newton, we could think that:

> We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances. To this purpose the philosophers say that Nature does nothing in vain, and more is in vain when less will serve; for Nature is pleased with simplicity, and affects not the pomp of superfluous causes (Newton, 1846: Book 3; p. 384).

We might reject either or both of these claims, but that we *can* reject parsimony tells us nothing about whether it is a primitive or not. So, why should we think of parsimony as a primitive? To see this, consider the discussion of theoretical virtues in Nolan (2015). Nolan considers how we might justify theoretical virtues. One method is to support one theoretical virtue through a further virtue (or virtues). For example, parsimony might be a valuable theoretical virtue as it leads to simplicity, which is itself a theoretical virtue. The problem is that we now need to justify simplicity. Nolan concludes his assessment of this method of justifying theoretical virtues by saying that:

> such justifications of theoretical virtues tend to bring the problem of justifying the other virtues into sharp focus; but to some extent this sort of bump-shifting is unavoidable unless there is a way to justify a method without using any method. And there isn't. (Nolan, 2015: 225)

Our initial characterisation of a primitive was that a term is primitive within a theory when, relative to that theory, that term is not defined except in a circular way. The 'bump-shifting' that Nolan mentions suggests that theoretical virtues are primitive-like. On this first method, we cannot justify parsimony without appealing to other theoretical virtues, which in turn, will be justified through other theoretical virtues, including parsimony. The justification is circular, and so we are ultimately forced to accept them as primitives within our theory.

The second method of justification for theoretical virtues that Nolan discusses is to:

> look at past successes in inquiry and diagnose what was good about the method that yielded those successes. If simplicity was crucial to Einstein's breakthroughs about relativity, or to the Copernican/Galilean/Newtonian revolution in cosmology, for example, then that may provide us with good reason to think that simplicity, of the relevant sort, is a theoretical virtue

[10] See inter alia Baker (2003, 2016), Brenner (2017), Derkse (1992), Forster and Sober (1994), and Sober (1981, 2015) for various discussions of parsimony and simplicity, both applied to particular cases and in general.

(Nolan, 2015: 225).

The view is that the theoretical virtue as it is applied shows us that it is valuable. However, as Nolan points out, how do we evaluate 'success'? We cannot simply assign favour to those theories that already display those theoretical virtues that we are interested in. If 'success' is shown by theories having explanatory power whilst being parsimonious, then we have not justified parsimony in looking at the success of those theories. We cannot justify the adoption of a theoretical virtue on the grounds that it brought success if those successes are at least in part taken to be successes in virtue of them exemplifying that virtue.

As Nolan comments, this problem whilst not negligible, is also not insurmountable. Sometimes, we do discover what characteristics our inquiry should have by seeing what has worked before. However, this again illustrates the primitive-like nature of theoretical virtues. Much like other examples of primitives, we cannot endorse a theoretical virtue except by showing how that virtue helps us to explain what we are trying to explain. This is the same as the positing of ontological primitives and then showing that through positing that primitive we can explain the phenomenon we want to explain.[11] It seems reasonable therefore to think that theoretical virtues play a primitive-like role within our theories.

Parsimony, and other theoretical virtues potentially, therefore seem to be primitive-like. What about the ontological/ideological distinction? Theoretical virtues are clearly not ontological. Even if reality is best thought of as parsimonious, this is not because reality contains some entity that is 'parsimony'. It is clear that we should not reify parsimony, nor posit it as a property of *entities*. If parsimony is a property at all, then it is a property of theories, not things.

Perhaps we should therefore think of theoretical virtues as further bits of ideology. If this is the case, then theoretical virtues might be a particular example of some kind of primitive discussed earlier. However, if we take theoretical virtues to be parts of our ideology, and, as argued, we take them to be primitive because they resist further analysis, then we must recognise that these theoretical virtue ideological primitives play a very different role than other ideological primitives. This is because the normal role for theoretical virtues is to allow us to compare competing theories. This means that theoretical virtues, unlike other posited ideological primitives, are 'inter-theoretic' – they are not part of any single theory, but are, at best, part of some more (perhaps maximal) general methodological theory.[12]

There is, however, a further issue for those who take theoretical virtues to be instances of ideology. Ideology is sometimes taken to be 'external' or 'in the world'. I have in mind here people like Sider (2011) who argues that the existential quantifier carves reality at its joints. This therefore is a piece of ideology that is non-formal in some sense. It is 'in' the world even if it does not exist; it is ontic, yet it is a bit of ideology.

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11 Sider similarly suggests that the choice of primitive can be justified if that choice leads to an explanatory and predictively successful theory (see Sider 2011: 14-16, 51, 114).

12 I am grateful to an anonymous reviewer on this point.

If we accept that ideology can be like this, then we should resist the idea that theoretical virtues are ideology. Theoretical virtues are unavoidably formal. They are epistemological limits on our theories and should never be taken to be ontic even if we believe that reality conforms to them – or perhaps more accurately that a theory that abides by such theoretical virtues accurately describes the world or the phenomenon in question. Even if we believe that reality contains very few posits that does not mean that reality is parsimonious. The reason for this is that parsimony (and other theoretical virtues) are comparative. We can only make sense of a theory being parsimonious in relation to a less parsimonious theory. If we accept, as most do, that there is only one reality (irrespective of how many ways to describe reality there are), then reality cannot be compared to some further reality to see which is more parsimonious. There is no alternative reality to compare reality to in order to see how parsimonious it is.[13]

These issues point against simply taking theoretical virtues as being part of our ideology, and instead, I argue, suggest rather that theoretical virtues are some alternative type of primitive that does not fit into the four-way distinction outlined above. Thus, my proposal is to take theoretical virtues to be meta-theoretical ideological primitives. This would distinguish them from the ideological primitives within first-order theories, but would maintain the importance of theoretical virtues in our theory-choice, and their theory-shaping role, without being part of the theories that they shape. Theoretical virtues as meta-theoretical ideological primitives explains how theoretical virtues are able to perform their role as criteria by which we can compare first-order theories, without forcing us to admit of any primitive that is neither ontological or ideological.

However, either way – whether we resist the above points and take them to be first-order ideological posits, or meta-theoretical ideological posits – that theoretical virtues are *primitive* bits of ideology needs to be explicitly recognised. The choice of which theoretical virtue(s) guide us can (at least) be as important as positing a primitive resemblance relation, or a primitive kind of entity. Theoretical virtues play just as strong a structuring role within our theories and dictate constraints on that theory in the same way as more explicitly acknowledged primitive posits. However, theoretical virtues are not often discussed as important primitive ideological commitments in the way that, say, the exact resemblance relation is debated as an ideological primitive in the bundle-trope theory of attribute agreement. Theories are expected to defend their positing of standard ideological or ontological primitives, but are rarely asked to defend their appeal to a particular theoretical virtue, despite, as we have noted with parsimony, the lack of clarity about those theoretical virtues.

5. Primitive Choice

I have outlined a number of different kinds of primitives. What then are the prospects for comparing primitives? Are all primitives created equal? First, the above distinctions have shown that there are a number of different *kinds* of primitives, but that there appears to be no definite

[13] This is even the case for Lewis' modal realism as reality for Lewis is the total of *all* possible worlds.

hierarchy of 'better' or 'worse' primitive posits. Despite all this, it is not the case that anything goes. We still need to be able to adjudicate between different sets of primitives. I cannot offer any fully detailed methodology here, but I offer some (hopefully illuminating) thoughts.

Thankfully, we need not compare sets of primitives in isolation. We can compare primitives by looking at the consequences that a *set* of primitives entails. Take a theory, T. T posits a set of (ontological and/or ideological) primitives P. From P we should be able to derive the commitments of T. From P, we should be able to understand how T would provide solutions to the kinds of problems that we take to be important for theories in the domain to provide solutions to. The value of the primitives can, and should, be assessed with respect to the widest scope of the theory in question. The set of primitives P can in this way be compared to the set of primitives P* within theory T* by seeing how well T and T* provide the wanted solutions to the relevant questions and puzzles.

This suggests that the best way to compare primitives is to look at those primitives relative to the *whole* theory within which they are posited, thus requiring a global understanding and appreciation in our theory construction. Put another way, this indicates an explicit need for so-called 'system-building'. Once we have rejected those theories built upon sets of primitives that are either at first glance, or through more detailed analysis, inconsistent, then we would be left with a clearer range of consistent whole-theory options. Further conceptual or empirical work may strike out what previously seemed to be a possible theory. It may be that we will ultimately be able to through further analysis realise that only one option remains open to us, though this is not obviously the case. How we decide between those remaining options is a difficult question, and may change from domain to domain, but we can only compare sets of primitives fully if we know the comparison class against which to compare them, and that requires a global perspective on a theory and its benefits.[14]

To see this in action, and going back to a previous example, grounding theorists seek to eliminate many of the relations that other metaphysicians have posited in favour of a single 'Big-G Grounding' relation. This, I've argued, can be interpreted as an attempt to focus on a specific primitive relation and consider whether this single primitive relation can explain what was previous explained through a set of primitive (or a set of primitive and non-primitive) relations. The methodology of grounding theorists seems to have often (even if not by design) been to explain on a case-by-case basis how grounding can explain various phenomena.[15] One example of grounding would not, by itself, be persuasive with respect to the claim that the various metaphysical relations can be replaced with a single unitary notion of grounding.

I wish to remain neutral here as to whether this metaphysical account is correct. My point is that the theory, and grounding as a primitive posit, only becomes persuasive if we consider the view

[14] For a version of this view within the domain of metaphysics see Lowe (1998: chapter 1; 2011), and Miller (forthcoming).

[15] See references in footnote 6. Whilst these applications overlap, they are independent discussions of grounding, relative to the specific aims listed.

in a global way. The defence of grounding has been local with each new example taken up individually, but grounding as an overarching claim is only persuasive if multiple previously posited (primitive) relations can be subsumed under it. The way to compare the grounding account to its competitors is to compare the primitive(s) invoked relative to the wider metaphysics that they are within.

Second, we must be open about both what our primitives are, and what kinds of primitives they are. Whilst there may not be anything inherently better or worse between, say, positing ontological rather than ideological primitives, that we have posited ontological primitives will mean that that theory is importantly different from one that favours ideological primitives. It is through explicit discussion of the primitives we are positing within our theory that we are able to then compare them. Only then can we begin to see which theories favour ideology over ontology, or kind parsimony over number parsimony, or are ultimately driven by a commitment to certain theoretical virtues. Whether or not we find the theories persuasive will at least partially depend on these issues.

6. Conclusion

The aims of this paper have been both diagnostic and prescriptive. I have characterised what primitives are, and made some key distinctions between types of primitives. I have also argued that there are some primitives – most centrally theoretical virtues – that are primitives in our theories, but do not often get explicitly treated as such.

I am not arguing that we should avoid appealing to primitives, or to primitive theoretical virtues. Quite the opposite – I have claimed that we cannot hope to avoid primitives, but that we should be open and honest about what primitives we are invoking. Primitives shape a theory from the ground up. Which ones we adopt is a crucial part of a theory. We should not be worried by this. An appeal to a primitive is not a sign that the theory has failed. Rather, identifying the primitives of a theory allows us to better understand how the elements of that theory tie together. Seeing how positing certain types of primitives will affect the resultant theory is one of the best ways to explore what theoretical or conceptual space is open to us. Primitives cannot, and should not, be eliminated from our theories, but we should learn to recognise the different kinds of primitives and embrace them more openly.

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